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EXAMINER	
KAO, CHIH CHENG G	
ART UNIT	**PAPER NUMBER**
2882	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/704,733	ALLEN, SUSAN D.	
	Examiner	Art Unit	
	Chih-Cheng Glen Kao	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29 and 36-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29 and 36-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 November 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *200507*.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements filed 6/21/2002, 10/31/2002, and 3/28/03 fail to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but information referred to therein has not been considered.

In particular, the following publications are missing: C.H. Lee and S.D. Allen, Laser Fabricated Optic Taps and Applications to Sensors, Electrochemical Society, New Orleans, LA (11/1993) and K. Patil, M.S. thesis, Indian Institute of Technology, Kanpur, (1995).

Drawings

2. The proposed drawings filed 3/28/03 have been approved by the Examiner. New corrected replacement drawings reflecting the above proposed changes are now required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 47 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 46, which claim 47 depends from, recites that light emitted out of the one or more optical fibers or other waveguides does not exit the one or more optical fibers or other waveguides through the one or more tap structures. However, the recitations in claim 47 seem to contradict the above limitations of claim 46 by reciting that light passes through the one or more tap structures. When the light passes through the one or more tap structures, the light will exit the one or more optical fibers or other waveguides through the one or more tap structures. Therefore, claim 47 is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner has examined the claim as best understood as follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 7, 8, 10, 12-14, 19, 20, 22, 23, 25, 27, 28, 36-39, and 42-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Hekman et al. (US Patent 5037172).

5. Regarding claims 1, 25, 27, and 28, Hekman et al. discloses an apparatus comprising one or more optical fibers, waveguides, or photon channeling structures (Title) and one or more tap structures (Fig. 1, #16) formed on the one or more fibers, waveguides, or channeling structures so that the tap structures direct light or photons in predetermined directions to create an optimized desired illumination pattern by scattering, diffraction, reflection, and/or refraction of portions of light or photons through and out of the one or more optical fibers, waveguides, or photon channeling structures (Fig. 5A), wherein a parameter of each of the tap structures is determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light (col. 3, line 64, to col. 4, line 14, and col. 8, lines 41-45).

With regards to the taps being commercially produced, modeled, or formed by using pattern parameters determined by modeling the desired illumination pattern, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

6. Regarding claims 7 and 8, Hekman et al. further discloses tap structures having an asymmetrical geometry (Fig. 16A) or extending radially in an arc (Fig. 15).

7. Regarding claim 10, Hekman et al. further discloses tap structures which are arranged in an array extending along a length of the one or more optical fibers or waveguides (Fig. 4, #34)

8. Regarding claims 12-14, 19, 20, 22, and 23, Hekman et al. further discloses one or more light sources that provides the light to one or more optical fibers or waveguides (col. 5, lines 26-27), which are necessarily selectively controllable having varying illumination powers (on or off), providing infrared light with one or more lasers, high power laser diodes, or light emitting diodes (col. 9, lines 23-26).

9. Regarding claims 36 and 37, Appeldorn et al. further discloses tap structures of a desired shape, depth, and spacing to create a desired illumination pattern based on a particular application (abstract, and Figs. 1 and 4A, and Table 1).

10. Regarding claims 38, 39, and 42-45 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

11. Claims 1, 7, 8, 10-14, 17-20, 22, 23, 25-28, 36-39, 42-48, are rejected under 35 U.S.C. 102(b) as being anticipated by Appeldorn et al. (US Patent 5432876).

12. Regarding claims 1, 25, 27, 28, and 46, Appeldorn et al. discloses an apparatus comprising one or more optical fibers, waveguides, or photon channeling structures (Title) and

one or more tap structures (Fig. 1, #4) formed on the one or more fibers, waveguides, or channeling structures so that the tap structures direct light or photons in predetermined directions to create an optimized desired illumination pattern by scattering, diffraction, reflection, and/or refraction of portions of light or photons through and out of the one or more optical fibers, waveguides, or photon channeling structures (Figs. 8 and 10), wherein a majority of the light emitted out of the one or more fibers or other waveguides does not exit the one or more fibers or waveguides through the one or more tap structures (col. 7, lines 59-67), wherein a parameter of each of the tap structures is determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light (col. 9, lines 28-38).

With regards to the taps being commercially produced, modeled, or formed by using pattern parameters determined by modeling the desired illumination pattern, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

13. Regarding claim 7, Appeldorn et al. further discloses tap structures having an asymmetrical geometry (Fig. 1, #4).

14. Regarding claim 8, Appeldorn et al. further discloses tap structures extending radially in an arc or completely around the one or more optical fibers or waveguides (Fig. 4a, #14).

15. Regarding claim 10, Appeldorn et al. further discloses tap structures arranged in an array extending along a length of the one or more optical fibers or waveguides (Fig. 9, #4).

16. Regarding claim 11, Appeldorn et al. further discloses tap structures having a length extending in a longitudinal direction of the respective optical fiber or a waveguide larger than a width extending in a radial direction of the respective optical fiber or waveguide (Fig. 4b, #14, and col. 8, line 48).

17. Regarding claim 12, Appeldorn et al. further discloses one or more light sources providing light to the one or more optical fibers or waveguides (col. 5, lines 62-68).

18. Regarding claims 13 and 14, Appeldorn et al. would necessarily have one or more selectively controllable light sources with varying illumination powers by turning them on and off.

19. Regarding claims 17-20, 22, and 23, Appeldorn et al. further discloses light sources providing visible, UV, or infrared light (col. 5, lines 67-68) comprising lasers, laser diodes, or light emitting diodes (col. 5, lines 66-67).

20. Regarding claim 26, Appeldorn et al. further discloses greater than approximately 90% of the light output out of the fibers or waveguides (col. 4, lines 6-18 and 60-65).

21. Regarding claims 36 and 37, Appeldorn et al. further discloses tap structures of a desired shape, depth, and spacing to create a desired illumination pattern based on a particular application (col. 8, lines 4-20).

22. Regarding claims 38, 39, and 42-45 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

23. Regarding claim 47, Appeldorn et al. further discloses the majority of light emitted through the one or more fibers or waveguides directed in a direction toward a substantially opposite side of the one or more optical fibers or waveguides from the one or more tap structures (col. 7, lines 59-67).

24. Regarding claim 48, Appeldorn et al. further teaches tap structures formed in a cladding and at least a portion of a core (col. 7, lines 25-27).

25. Claims 1, 3, 6, 7, 10-12, 25, 27, 28, 36-39, and 42-47 are rejected under 35 U.S.C. 102(e) as being anticipated by Lea et al. (US Patent 6367941).

26. Regarding claims 1, 25, 27, and 28, Lea et al. discloses an apparatus (Title) comprising one or more optical fibers, waveguides, or photon channeling structures (Fig. 1, #30) and one or more tap structures (Fig. 1, #18_1) formed on the one or more fibers, waveguides, or channeling

structures so that the tap structures direct light or photons in predetermined directions to create an optimized desired illumination pattern (Title, and Figs. 1, 4, and 6) by scattering, diffraction, reflection, and/or refraction of portions of light or photons (Fig. 1, #42) out of the one or more optical fibers, waveguides, or photon channeling structures (Fig. 1).

With regards to the taps being commercially produced, modeled, formed by using pattern parameters determined by modeling the desired illumination pattern, or a parameter determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

27. Regarding claim 3, Lea et al. further discloses the pattern generally in the shape of an arc (Fig. 7).

28. Regarding claim 6, Lea et al. further discloses one or more reflective surfaces within the one or more fibers or waveguides, wherein the reflected beam of light travels substantially opposite to the original direction of travel (Fig. 1, #42).

29. Regarding claim 7, Lea et al. further discloses one or more tap structures having an asymmetrical geometry (Fig. 3, #48_2).

30. Regarding claim 10, Lea et al. further discloses tap structures in an array along the length of the one or more fibers or waveguides (Fig. 3, #48_N).

31. Regarding claim 11, Lea et al. further discloses one or more tap structures each having a length extending in a longitudinal direction larger than a width extending in a radial direction (Fig. 3, #48_2).

32. Regarding claim 12, Lea et al. further discloses one or more light sources (col. 5, lines 36-38).

33. Regarding claims 36 and 37, Lea et al. further discloses the one or more tap structures comprising a plurality of structures of a specific shape, depth, and spacing to create a desired illumination pattern (Fig. 3, #48_N).

34. Regarding claims 38, 39, and 42-45 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

35. Regarding claims 46 and 47, Lea et al. discloses an apparatus (Fig. 1) comprising one or more optical fibers or other waveguides (Fig. 1, #30) for receiving light (Fig. 1, #40), and one or more tap structures (Fig. 1, #18) formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or more optical fibers or waveguides,

the one or more tap structures directs the light in predetermined directions so as to create a desired illumination pattern (Title, and Figs. 1, 4, and 6) by scattering, diffraction, reflection, and/or refraction of portions of light through the one or more optical fibers or other waveguides, wherein a majority of the light emitted out of the one or more optical fibers or other waveguides does not exit the one or more optical fibers or other waveguides through the one or more tap structures, and wherein the majority of light emitted through the one or more optical fibers or other waveguides is directed in a direction toward a substantially opposite side of the one or more optical fibers or waveguides (Fig. 1, #42) from the one or more tap structures.

36. Claims 1, 5, 10-12, 16-19, 25, 27-29, 36-39, and 42-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori (US Patent 4389085).

37. Regarding claims 1, 25, 27, and 28, Mori discloses an apparatus (Title) comprising one or more optical fibers, waveguides, or photon channeling structures (Fig. 7) and one or more tap structures (Fig. 7, #14a) formed on the one or more fibers, waveguides, or channeling structures so that the tap structures direct light or photons in predetermined directions to create an optimized desired illumination pattern (col. 7, lines 33-37) by scattering, diffraction, reflection, and/or refraction of portions of light or photons (Claim 1) out of the one or more optical fibers, waveguides, or photon channeling structures (Fig. 7).

With regards to the taps being commercially produced, modeled, formed by using pattern parameters determined by modeling the desired illumination pattern, or a parameter determined based on an effect that all previous tap structures, along a propagation direction of the light, have

on a propagation of the light, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

38. Regarding claim 5, Mori further discloses the pattern generally conical in shape (Fig. 9A, and col. 7, lines 38-48).

39. Regarding claim 10, Mori further discloses tap structures in an array along the length of the one or more fibers or waveguides (Fig. 9A, R_N).

40. Regarding claim 11, Mori further discloses one or more tap structures each having a length extending in a longitudinal direction larger than a width extending in a radial direction (Fig. 7, #14a).

41. Regarding claim 12, Mori further discloses one or more light sources (Fig. 9A, #16).

42. Regarding claims 16-19 and 29, Mori further discloses incoherent light or sunlight which has visible, UV, and infrared wavelengths (Abstract, "sunlight").

43. Regarding claims 36 and 37, Mori further discloses the one or more tap structures comprising a plurality of structures of a specific shape, depth, and spacing to create a desired illumination pattern (col. 7, lines 33-37).

44. Regarding claims 38, 39, and 42-45 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

45. Claims 1, 12-14, 17, 25, 27, 28, 36-39, and 42-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Ciupke et al. (US Patent 5461547).

46. Regarding claims 1, 25, 27, 28, and 46, Ciupke et al. discloses an apparatus (Title) comprising one or more optical fibers, waveguides, or photon channeling structures (Fig. 2, #11) and one or more tap structures (Fig. 2, #17) formed on the one or more fibers, waveguides, or channeling structures so that the tap structures direct light or photons in predetermined directions to create an optimized desired illumination pattern (Title, and Figs. 2-5) by scattering, diffraction, reflection, and/or refraction of portions of light or photons (Fig. 2, #16) out of the one or more optical fibers, waveguides, or photon channeling structures, wherein a majority of light emitted out of the fibers or other waveguides does not exit the one or more fibers or waveguides through the one or more tap structures (Fig. 2, #17).

With regards to the taps being commercially produced, modeled, formed by using pattern parameters determined by modeling the desired illumination pattern, or a parameter determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light, the method of forming a device is not germane to the issue of

patentability of the device itself. Therefore, these limitations have not been given patentable weight.

47. Regarding claims 12-14, Ciupke et al. further discloses one or more light sources providing light to the one or more optical fibers or waveguides (Fig. 2, #21), which would necessarily have one or more selectively controllable light sources having varying illumination powers by turning them on and off.

48. Regarding claim 17, Ciupke et al. further discloses a light source providing visible light (col. 3, lines 16-17, and Fig. 2, #21).

49. Regarding claims 36 and 37, Ciupke et al. further discloses the one or more tap structures comprising a plurality of structures of a specific shape, depth, and spacing to create a desired illumination pattern (col. 2, lines 48-49).

50. Regarding claims 38, 39, and 42-45 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

51. Regarding claim 47, Ciupke et al. further discloses the majority of light emitted through the one or more fibers or waveguides directed in a direction toward a substantially opposite side of the one or more optical fibers or waveguides from the one or more tap structures (Fig. 2, #16).

52. Claims 1, 3, 4, 6, 8-14, 17, 19, 20, 23, 24, 25, 27, 28, and 36-45 are rejected under 35 U.S.C. 102(e) as being anticipated by McGaffigan (US Patent 6031958).

53. Regarding claims 1, 25, 27, and 28, McGaffigan discloses an apparatus comprising one or more optical fibers, waveguides, or photon channeling structures (Title) and one or more tap structures (Fig. 2, #27) formed on the one or more fibers, waveguides, or channeling structures so that the tap structures direct light or photons in predetermined directions to create an optimized desired illumination pattern by scattering, diffraction, reflection, and/or refraction of portions of light or photons through and out of the one or more optical fibers, waveguides or photon channeling structures (Fig. 10, and col. 9, lines 4-5).

With regards to the taps being commercially produced, modeled, formed by using pattern parameters determined by modeling the desired illumination pattern, or a parameter determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

54. Regarding claims 3 and 4, McGaffigan further discloses a generally cylindrical or arc shaped illumination pattern (Cover Figure).

55. Regarding claim 6, McGaffigan further discloses one or more reflective surfaces within the fibers or waveguides, wherein the one or more reflective surfaces reflects the light so that the reflected beam of light travels in a direction substantially opposite to the original direction of travel of the light (Fig. 10A, #130 and 131).

56. Regarding claims 8, 9, and 24, McGaffigan further discloses tap structures extending radially in an arc or completely circular around the fibers or waveguides (Fig. 4).

57. Regarding claims 10 and 11, McGaffigan further discloses tap structures arranged in an array extending along a length of the fibers or waveguides, wherein the tap structures have a length extending in a longitudinal direction of the respective optical fiber or waveguide larger than a width extending in a radial direction of the fiber or waveguide (Fig. 33, #636).

58. Regarding claims 12-14, McGaffigan further discloses one or more light sources providing light to the one or more optical fibers or waveguides (Fig. 3, #31), which would necessarily have one or more selectively controllable light sources having varying illumination powers by turning them on and off.

59. Regarding claims 17 and 19, McGaffigan further discloses visible (col. 7, lines 12-18) or infrared light (col. 6, lines 29-31).

60. Regarding claims 20 and 23, McGaffigan further discloses a laser (Claim 8) or light emitting diode (Claim 7).

61. Regarding claims 36 and 37, McGaffigan further discloses tap structures of a desired shape, depth, and spacing to create a desired illumination pattern based on a particular application (col. 23, lines 19-27).

62. Regarding claims 38-45 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

63. Claims 1, 3, 4, 6, 8-14, 17, 19, 20, 23, 24, 25, 27, 28, and 36-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGaffigan in view of Appeldorn et al.

64. Regarding claims 1, 25, 27, and 28, McGaffigan discloses an apparatus comprising one or more optical fibers, waveguides, or photon channeling structures (Title) and one or more tap structures (Fig. 2, #27) formed on the one or more fibers, waveguides, or channeling structures

so that the tap structures direct light or photons in predetermined directions to create an optimized desired illumination pattern by scattering, diffraction, reflection, and/or refraction of portions of light or photons through and out of the one or more optical fibers, waveguides or photon channeling structures (Fig. 10, and col. 9, lines 4-5).

However, McGaffigan does not disclose a parameter determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light.

Appeldorn et al. teaches a parameter determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light (col. 9, lines 28-38).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of McGaffigan with the parameter of Appeldorn et al., since one would be motivated to make such a modification to better maintain uniform light intensity and compensate for light loss (col. 9, lines 23-38) as shown by Appeldorn et al.

With regards to the taps being commercially produced, modeled, or formed by using pattern parameters determined by modeling the desired illumination pattern, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

65. Regarding claims 3 and 4, McGaffigan further discloses a generally cylindrical or arc shaped illumination pattern (Cover Figure).

66. Regarding claim 6, McGaffigan further discloses one or more reflective surfaces within the fibers or waveguides, wherein the one or more reflective surfaces reflects the light so that the reflected beam of light travels in a direction substantially opposite to the original direction of travel of the light (Fig. 10A, #130 and 131).

67. Regarding claims 8, 9, and 24, McGaffigan further discloses tap structures extending radially in an arc or completely circular around the fibers or waveguides (Fig. 4).

68. Regarding claims 10 and 11, McGaffigan further discloses tap structures arranged in an array extending along a length of the fibers or waveguides, wherein the tap structures have a length extending in a longitudinal direction of the respective optical fiber or waveguide larger than a width extending in a radial direction of the fiber or waveguide (Fig. 33, #636).

69. Regarding claims 12-14, McGaffigan further discloses one or more light sources providing light to the one or more optical fibers or waveguides (Fig. 3, #31), which would necessarily have one or more selectively controllable light sources having varying illumination powers by turning them on and off.

70. Regarding claims 17 and 19, McGaffigan further discloses visible (col. 7, lines 12-18) or infrared light (col. 6, lines 29-31).

71. Regarding claims 20 and 23, McGaffigan further discloses a laser (Claim 8) or light emitting diode (Claim 7).

72. Regarding claims 36 and 37, McGaffigan further discloses tap structures of a desired shape, depth, and spacing to create a desired illumination pattern based on a particular application (col. 23, lines 19-27).

73. Regarding claims 38-45 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

74. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mori as applied to claim 1 above.

Mori discloses an apparatus as recited above.

However, Mori does not explicitly disclose a generally spherical illumination pattern.

Mori further discloses that tap structures "may be in any suitable shapes ... depending upon the desired light diffusion or illumination effects" (col. 7, lines 33-37).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Mori with a generally spherical illumination pattern, since such a modification would have only involved a mere change in the shape of a tap structure. A change in the shape of the tap structure is generally recognized as being within the level of ordinary skill in the art (col. 7, lines 33-37) as shown by Mori. One would be motivated

to incorporate a spherical pattern to distribute light to all areas that require light simultaneously (col. 8, lines 6, lines 38-45) as implied from Mori, thus only needing one point as a light source.

75. Claims 4, 8, 9, 15-17, 20-24, 26, 29, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lea et al. as respectively applied to claims 1, 12, 25, and 27 above, and further in view of McGaffigan (US Patent 6031958).

76. Regarding claim 4, Lea et al. discloses an apparatus as recited above.

However, Lea et al. does not seem to explicitly disclose a generally cylindrical illumination pattern.

McGaffigan teaches a generally cylindrical illumination pattern (Cover Figure).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Lea et al. with the cylindrical illumination pattern of McGaffigan, since one would be motivated to incorporate such a pattern to better see the optical effects from all angles (Cover Figure) as implied from McGaffigan.

77. Regarding claims 8, 9, and 24, Lea et al. discloses an apparatus as recited above.

However, Lea et al. does not disclose tap structures extending radially in an arc or completely circular around the fibers or waveguides.

McGaffigan teaches tap structures extending radially in an arc or completely circular around the fibers or waveguides (Fig. 4).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Lea et al. with the tap structures extending radially or completely circular around the fibers or waveguides of McGaffigan, since one would be motivated to incorporate such an arrangement to enhance desired optical effects (col. 4, lines 34-36, and col. 3, lines 65-67) as implied from McGaffigan.

78. Regarding claims 15 and 20-23, Lea et al. discloses an apparatus as recited above.

However, Lea et al. does not seem to explicitly disclose a semiconductor laser, which is coherent, or light emitting diode.

McGaffigan teaches a laser (Claim 8), which is coherent, or light emitting (Claim 7) diode.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Lea et al. with the laser diode of McGaffigan, since one would be motivated to incorporate such a light source to better see the optical effects (Fig. 14A) in an extremely small system (col. 12, lines 60-63) as implied from McGaffigan.

It would also have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the suggested apparatus of Lea et al. in view of McGaffigan with a semiconductor diode, since it would have been within general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. One would be motivated to incorporate semiconductor material for its ease of making small devices.

79. Regarding claims 16, 17, and 29, Lea et al. discloses an apparatus as recited above.

However, Lea et al. does not seem to explicitly disclose incoherent visible light.

McGaffigan teaches incoherent (Fig. 8, #81) visible light (col. 7, lines 12-18).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Lea et al. with the incoherent visible light of McGaffigan, since one would be motivated to incorporate such a light source to better see the optical effects (Fig. 14A) as implied from McGaffigan.

80. Regarding claim 26, Lea et al. in view of McGaffigan suggests an apparatus as recited above.

However, Lea et al. does not seem to explicitly disclose 90% or higher light output.

Lea et al. (Fig. 3, #43) and McGaffigan (Fig. 18A, #262, and Fig. 22) teach desiring higher light output.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further modify the apparatus of Lea et al. with 90% or higher output, since wherein the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges only involves routine skill in the art. For example, if the optical fiber were extremely long and bent at angles such as those seen in McGaffigan (Fig. 38, #785), the percentage of light not hitting one of the tap structures would be extremely low, thus producing a light output higher than 90 percent. One would be motivated to modify the apparatus to emit 90% or higher output to ensure that the illumination is bright enough to see.

81. Regarding claims 40 and 41 and the taps being modeled by an iterative or theoretical process, the method of forming a device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

82. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ciupke et al. as applied to claim 1 above, and further in view of Tai et al. (US Patent 5359691).

Ciupke et al. discloses an apparatus as recited above.

However, Ciupke et al. does not explicitly disclose one or more reflective surfaces within the fiber or waveguide that reflects light so that the reflected beam of light travels in a direction substantially opposite to the original direction of travel of light.

Tai et al. teaches one or more reflective surfaces within the fiber or waveguide that reflects light so that the reflected beam of light travels in a direction substantially opposite to the original direction of travel of light (Fig. 1, #18 and 34).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Ciupke et al. with the reflective surface of Tai et al., since one would be motivated to make such a modification to extract as much light as possible without losing light to the side.

83. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lea et al. as applied to claim 12 above, and further in view of Currie (US Patent 5465194).

Lea et al. discloses an apparatus as recited above.

However, Lea et al. does not disclose a light source selectively controllable having varying illumination powers.

Currie teaches a light source selectively controllable having varying illumination powers (col. 3, lines 56-67).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Lea et al. with the selectively controllable light source of Currie, since one would be motivated to incorporate this to provide a means for better signifying different conditions (col. 3, lines 56-67) as implied from Currie.

84. Claims 15, 16, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ciupke et al. as applied to claims 12 and 27 above, and further in view of Winston et al. (US Patent 5528720).

Ciupke et al. discloses an apparatus as recited above.

However, Ciupke et al. does not explicitly disclose coherent or incoherent light.

Winston et al. teaches coherent or incoherent light (col. 5, lines 65-67).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Ciupke et al. with the lights of Winston et al., since one would be motivated to make such a modification to provide cheaper alternatives with incoherent light or higher light intensities for viewing with coherent light.

85. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lea et al. as applied to claim 12 above, and further in view of Pollack (US Patent 4935722).

Lea et al. discloses an apparatus as recited above.

However, Lea et al. does not disclose infrared light.

Pollack teaches infrared light (Abstract).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the apparatus of Lea et al. with the infrared light of Pollack, since one would be motivated to incorporate this to provide a means to better signal someone with red light while using a transparent medium that does not obscure the user's vision (col. 1, lines 40-55) as shown by Pollack.

86. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Appeldorn et al. as applied to claim 20 above, and further in view of Kapron et al. (US Patent 3779628).

Appeldorn et al. discloses an apparatus as recited above. Appeldorn et al. further discloses a laser diode (col. 5, line 67).

However, Appeldorn et al. does not explicitly disclose a semiconductor laser diode.

Kapron et al. teaches a semiconductor laser diode (col. 2, lines 5-10).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Appeldorn et al. with the semiconductor laser diode of Kapron et al., since one would be motivated to make such a modification to make an apparatus more compact (col. 2, lines 5-10) as shown by Kapron et al.

87. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lea et al. as applied to claim 46 above, and further in view of Appeldorn et al. (US Patent 5432876).

Lea et al. discloses an apparatus as recited above.

However, Lea et al. does not disclose tap structures formed in a cladding and at least a portion of a core.

Appeldorn et al. teaches tap structures formed in a cladding and at least a portion of a core (col. 7, lines 25-27).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the apparatus of Lea et al. with the tap structures of Appeldorn et al., since one would be motivated to make such a modification to more selectively emit light (col. 3, lines 20-22) as shown by Appeldorn et al.

Response to Arguments

88. Applicant's arguments with respect to at least claims 1, 24, 25, 27, and 46 have been considered but are moot in view of the new ground(s) of rejection.

89. Applicant's arguments filed 6/28/04 have been fully considered, but they are not persuasive.

Upon further consideration regarding the patentable weight of a parameter of each of the modeled tap structures being determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light, in apparatus claims, this limitation has not been given patentable weight since the method of forming a device is not germane to the issue of patentability of the device itself.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gk

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